



Revision: **2**

Effective Date: **September 2005**

Document Catalog Number: **ER2005-0157**



## **Environmental Stewardship Division– Environmental Remediation and Surveillance Program**

# **Glossary**

**LA-UR-05-3688**

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## Environmental Remediation and Surveillance Program

# Glossary

This glossary contains the **official** definitions of terms to be used in documents of the Environmental Stewardship Division's Environmental Remediation and Surveillance (ERS) Program. **No alterations of any type (including editorial changes) can be made to the glossary definitions.**

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The glossary definitions were created by ERS subject matter experts or were taken from sources such as U.S. Department of Energy guidelines; the March 1, 2005, Compliance Order on Consent (Consent Order); or other regulatory documentation.

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- alteration of an existing term or definition, or
- deletion of an existing term or definition.

If possible, the ERS Program participant requesting the review should provide the names of two or three subject matter experts who are qualified to review the proposed change(s).

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**abandonment**—The plugging of a well or borehole in a manner that precludes the migration of surface runoff or groundwater along the length of the well or borehole.

**absorption**—The uptake of water, other fluids, or dissolved chemicals by a cell or organism (e.g., tree roots absorb dissolved nutrients in soil).

**accelerated corrective action**—A cleanup process used to implement presumptive remedies at small-scale and relatively simple sites where groundwater contamination is not a component of the accelerated cleanup, where the remedy is considered to be the final remedy for the site, and where the fieldwork will be accomplished within 180 days of the start of field activities. Accelerated corrective actions may be implemented before the approval of the accelerated corrective action work plan by the New Mexico Environment Department.

**accelerated corrective measure**—A cleanup process meeting the same criteria as an accelerated corrective action, except that an accelerated corrective measure cannot be implemented before New Mexico Environment Department approval of the accelerated corrective measure work plan.

**accuracy**—A measure of the closeness of measurements to the true value of the parameter being measured.

**action level**—(1) A numerical value that has been established by statistical analysis or has been set according to regulatory limits and is used as a criterion for action. Contamination found in a particular medium below an appropriate action level is not generally subject to remediation or further study. (2) A health- and environment-based concentration derived using chemical-specific toxicity information and standardized exposure assumptions. An action level can be developed on a facility-specific basis or can be taken from standardized lists.

**administrative authority**—For Los Alamos National Laboratory, one or more regulatory agencies, such as the New Mexico Environment Department, the U.S. Environmental Protection Agency, or the U.S. Department of Energy, as appropriate.

**administrative controls**—Nonphysical or nonengineered mechanisms for managing risks to human health and the environment.

**administrative order on consent**—A legal agreement signed by the U.S. Environmental Protection Agency and an individual, business, or other entity through which a violator agrees to pay for the correction of violations, take the required corrective or cleanup actions, or refrain from an activity. It describes the

actions to be taken, may be subject to a comment period, applies to civil actions, and can be enforced in court.

**administrative record**—All documents that the administrative authority considered, or relied on, when selecting the response action at a site, culminating in the record of decision for remedial action or an action memorandum for removal actions.

**adsorption**—The surface retention of solid, liquid, or gas molecules, atoms, or ions by a solid.

**adverse condition**—An all-inclusive term used to reference failures, malfunctions, defective items, and nonconformances.

**aggregate**—At the Los Alamos National Laboratory, an area within a *watershed* containing solid waste management units (SWMUs) and/or areas of concern (AOCs), and the media affected or potentially affected by releases from those SWMUs and/or AOCs. Aggregates are designated to promote efficient and effective corrective action activities.

**aliquot**—A measured portion of a sample taken for analysis.

**alkalinity**—In water analysis, the presence of carbonates, bicarbonates, and/or hydroxides, and occasionally borates, chlorates, silicates, or phosphates.

**alluvial**—Pertaining to geologic deposits or features formed by running water.

**alluvial fan**—A fan-shaped piedmont accumulation of alluvium.

**alluvium**—Soil deposited by a river or other running water.

**alpha radiation**—A form of particle radiation that is highly ionizing and has low penetration. Alpha radiation consists of two protons and two neutrons bound together into a particle that is identical to a helium nucleus and can be written as  $\text{He}^{2+}$ .

**analysis**—A critical evaluation, usually made by breaking a subject (either material or intellectual) down into its constituent parts, then describing the parts and their relationship to the whole. Analyses may include physical analysis, chemical analysis, toxicological analysis, and knowledge-of-process determinations.

**analyte**—The element, nuclide, or ion a chemical analysis seeks to identify and/or quantify; the chemical constituent of interest.

**analytical method**—A procedure or technique for systematically performing an activity.

**andesite**—Fine-grained intermediate volcanic rock, made up chiefly of plagioclase and pyroxene.

**annular seal**—The material (usually cement grout or bentonite) placed in the space between a borehole wall and a well casing for zone isolation. Annular seals are most often used to prevent surface contamination from entering a borehole.

**annular space (annulus)**—The space between a borehole wall and a well casing, or the space between a casing pipe and a liner pipe.

**anthropogenic**—Of, relating to, or resulting from, the influence of human beings.

**Appendix F, performance measures**—The measures that define Los Alamos National Laboratory's contractual requirements as established with the U.S. Department of Energy and the University of California (specifically in Section B, Performance Objectives, Criteria, and Measures for Operations and Administration, Parts II-1 and II-2).

**applicable or relevant and appropriate requirements (ARARs)**—(1) Those cleanup standards, standards of control, and other substantive requirements, criteria, or limitations promulgated under federal environmental, state environmental, or facility siting laws that specifically address a hazardous substance, pollutant, contamination, remedial action, location, or other circumstance found at a site. Only those state standards that are identified by a state in a timely manner and that are more stringent than federal requirements may be applicable (see National Contingency Plan, section 300.5). (2) Requirements promulgated under federal or state law that specifically address the circumstances at a site. (3) Requirements and environmental laws that may be either "applicable" or "relevant and appropriate," but not both. The identification of ARARs must take place on a site-specific basis.

**Approved Supplier List**—A roster of suppliers who are approved and qualified to provide items or services to the Environmental Remediation and Surveillance Program.

**aquifer**—An underground geological formation (or group of formations) containing water that is the source of groundwater for wells and springs.

**aquitard**—Geological formation that may contain groundwater but is not capable of transmitting significant quantities of it under normal hydraulic gradients.

**area of concern**—(1) A release that may warrant investigation or remediation and is not a solid waste management unit (SWMU). (2) An area at Los Alamos National Laboratory that may have had a release of a hazardous waste or a hazardous constituent but is not a SWMU.

**area of contamination**—As defined by the U.S. Environmental Protection Agency, certain areas of generally dispersed contamination that could be equated to a Resource Conservation and Recovery Act (RCRA) landfill. The movement of hazardous wastes within those areas would not be considered land disposal and would not trigger RCRA land-disposal restrictions. An area of contamination may be designated by the Environmental Remediation and Surveillance Program as part of a corrective action for waste management purposes, subject to approval by the administrative authority.

**area use factor**—The ratio of an organism's home range, breeding range, or feeding/foraging range to the area of the site under investigation.

**artificial fill**—A material that has been imported and typically consists of disturbed soils mixed with crushed Bandelier Tuff or other rock types.

**ash-flow tuff**—A tuff deposited by a hot, dense volcanic current. Ash-flow tuff can be either welded tuff or nonwelded tuff.

**as low as reasonably achievable (ALARA)**—(1) An approach to radiation protection for controlling or managing exposure (both individual and collective) to the work force and the general public. (2) An approach for controlling or managing releases of radioactive material to the environment at levels as low as social, technical, economic, practical, and public-policy considerations permit. ALARA is not a dose limit.

**assessment**—(1) The act of reviewing, inspecting, testing, checking, conducting surveillance, auditing, or otherwise determining and documenting whether items, processes, or services meet specified requirements. (2) An evaluation process used to measure the performance or effectiveness of a system and its elements. In this glossary, assessment is an all-inclusive term used to denote any one of the following: audit, performance evaluation, management system review, peer review, inspection, or surveillance.

**assessment endpoint**—In an ecological risk assessment, the expression of an environmental value to be protected (e.g., fish biomass or reproduction of avian populations).

**audit (quality)**—An independent, systematic examination to determine whether quality activities and related results comply with planned arrangements, whether these arrangements are implemented effectively, and whether they are suitable for achieving objectives.

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**background concentration**—Naturally occurring concentrations of an inorganic chemical or radionuclide in soil, sediment, or tuff.

**background data**—Data that represent naturally occurring concentrations of inorganic and radionuclide constituents in a geologic medium. Los Alamos National Laboratory's (the Laboratory's) background data are derived from samples collected at locations that are either within, or adjacent to, the Laboratory. These locations (1) are representative of geological media found within Laboratory boundaries, and (2) have not been affected by Laboratory operations.

**background level**—(1) The concentration of a substance in an environmental medium (air, water, or soil) that occurs naturally or is not the result of human activities. (2) In

exposure assessment, the concentration of a substance in a defined control area over a fixed period of time before, during, or after a data-gathering operation.

**background radiation**—The amount of radioactivity naturally present in the environment, including cosmic rays from space and natural radiation from soils and rock.

**background sample**—A sample collected from an area or site that is similar to the one being studied but known, or thought, to be free from constituents of concern.

**background value (BV)**—A statistically derived concentration (i.e., the upper tolerance limit [UTL]) of a chemical used to represent the background data set. If a UTL cannot be derived, either the detection limit or maximum reported value in the background data set is used.

**barrier**—Any material or structure that prevents, or substantially delays, the movement of solid-, liquid-, or gaseous-phase chemicals in environmental media.

**basalt**—A fine-grained, dark volcanic rock composed chiefly of plagioclase, augite, olivine, and magnetite.

**baseline contaminant level**—Anthropogenic soil concentrations of a given chemical associated with Los Alamos National Laboratory and/or with commercial activities or processes that may not be related to source material(s) or release(s) from within a solid waste management unit or area of concern.

**baseline data**—Data that result from samples not directly associated with, or attributed to, a site. Baseline data must be identified during planning as originating from baseline samples. They are not equivalent to Los Alamos National Laboratory background data, usually are specific to an industrial area (such as a technical area), and are not applicable to another site without approval by the administrative authority.

**baseline risk assessment**—A site-specific analysis of the potential adverse effects of hazardous constituents that have been released from a site in the absence of any controls or mitigating actions. A baseline risk assessment consists of the following four steps: data collection and analysis, exposure assessment, toxicity assessment, and risk characterization.

**bench-scale tests**—Small-scale tests of materials, methods, chemical processes, or biological processes, such as on a laboratory work table.

**bentonite**—An absorbent aluminum silicate clay formed from volcanic ash and used in various adhesives, cements, and ceramic fillers. Because bentonite can absorb large quantities of water and expand to several times its normal volume, it is a common drilling mud additive.

**best management practices**—Methods that have been determined to be the most effective, practical means of preventing or reducing pollution from nonpoint sources.



**beta radiation**—High-energy electrons emitted by certain types of radioactive nuclei, such as potassium-40. The beta particles emitted are a form of ionizing radiation also known as beta rays.

**bias**—The systematic deviation from a true value that remains constant over replicated measurements within the statistical precision of the measurement process.

**biomass**—The dry weight of living matter (including stored food) that is present in a species population. Biomass is expressed in terms of a habitat's given area or volume.

**bioremediation**—(1) The use of living organisms to clean up oil spills or to remove other pollutants from soil, water, or wastewater. (2) The use of organisms, such as harmless insects, to remove agricultural pests or to counteract diseases of trees, plants, and garden soil.

**blank**—A sample that is expected to have a negligible or unmeasurable amount of an analyte. Results of blank sample analyses indicate whether field samples might have been contaminated during the sample collection, transport, storage, preparation, or analysis processes.

**blind sample**—See single blind sample and double blind sample.

**borehole**—(1) A hole drilled or bored into the ground, usually for exploratory or economic purposes. (2) A hole into which casing, screen, and other materials may be installed to construct a well.

**borehole logging**—The process of making remote measurements of physical, chemical, or other parameters at multiple depths in a borehole.

**breccia**—A coarse-grained rock that consists of angular fragments cemented together or embedded in a fine-grained matrix.

**brownfields**—Abandoned, idle, or underused industrial and commercial facilities or sites where expansion or redevelopment is complicated by real or perceived environmental contamination. Brownfields can be in urban, suburban, or rural areas. The U.S. Environmental Protection Agency brownfields initiative helps communities mitigate potential health risks and restore the economic viability of such areas or properties.

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**calcrete**—See pedogenic calcite or caliche.

**caldera**—A large crater formed by a volcanic explosion or by the collapse of a volcanic cone.

**calibration**—A process used to identify the relationship between the true analyte concentration or other variable and the response of a measurement instrument, chemical analysis method, or other measurement system.

**calibration blank**—A calibration standard prepared to contain negligible or unmeasurable amounts of analytes. A calibration blank is used to establish the zero concentration point for analytical measurement calibrations.

**calibration standard**—A sample prepared to contain known amounts of analytes of interest and other constituents required for an analysis.

**caliche (properly called pedogenic calcite, also known as calcrete)**—A layer of hard subsoil encrusted with calcium carbonate that occurs in arid or semiarid regions or precipitates out of groundwater (groundwater caliche). Typically found in near-surface soil.

**canopy**—The cover formed by the leafy upper branches of surrounding trees and shrubs.

**canyon**—A stream-cut chasm or gorge, the sides of which are composed of cliffs or a series of cliffs rising from the chasm's bed. Canyons are characteristic of arid or semiarid regions where downcutting by streams greatly exceeds weathering.

**cap**—A modern engineered landfill cover that is designed and constructed to minimize or eliminate the release of constituents into the environment.

**casing**—A solid piece of pipe, typically steel, stainless steel, or polyvinyl chloride plastic, used to keep a well open in either unconsolidated material or unstable rock and as a means to contain zone-isolation materials, such as cement grout.

**catchment**—(1) A structure, such as a basin or reservoir, used for collecting or draining water. (2) The amount of water collected in such a structure. (3) A catching or collecting of water, especially rainwater.

**certificate of completion**—A document to be issued by the New Mexico Environment Department (NMED) under the March 1, 2005, Compliance Order on Consent (Consent Order) once NMED determines that the requirements of the Consent Order have been satisfied for a particular solid waste management unit or area of concern.

**certification**—A signed statement required by permits, or certain enforcement documents (e.g., a compliance order), that is submitted with reports and other information requested by the administrative authority. Certification ensures that a document and all of its attachments were prepared under the direction or supervision of an authorized person in accordance with a system designed to ensure that qualified personnel properly gather and evaluate the information submitted. Known violations of certification carry significant penalties.

**chain of custody**—An unbroken, documented trail of accountability that is designed to ensure the uncompromised physical integrity of samples, data, and records.

**chemical**—Any naturally occurring or human-made substance characterized by a definite molecular composition.

**chemical analysis**—A process used to measure one or more attributes of a sample in a clearly defined, controlled, and systematic manner. Chemical analysis often requires treating a sample chemically or physically before measurement.

**chemical interference**—A chemical or physical entity whose influence results in a decrease or increase in the response of an analytical method or other measurement system relative to the response obtained in the absence of the entity.

**chemical of concern**—A chemical identified in human-health or ecological risk assessments as posing a risk.

**chemical of potential concern (COPC)**—A detected chemical compound or element that has the potential to adversely affect human receptors as a result of its concentration, distribution, and toxicity.

**chemical of potential ecological concern**—A detected chemical compound or element that has the potential to adversely affect ecological receptors as a result of its concentration, distribution, and toxicity.

**cleanup**—A series of actions taken to deal with the release, or threat of a release, of a hazardous substance that could affect humans and/or the environment. The term cleanup is sometimes used interchangeably with the terms remedial action, removal action, or corrective action.

**cleanup levels**—Media-specific contaminant concentration levels that must be met by a selected corrective action. Cleanup levels are established by using criteria such as the protection of human health and the environment; compliance with regulatory requirements; reduction of toxicity, mobility, or volume through treatment; long- and short-term effectiveness; implementability; and cost.

**Code of Federal Regulations (CFR)**—A document that codifies all rules of the executive departments and agencies of the federal government. The code is divided into 50 volumes, known as titles. Title 40 of the CFR (referenced as 40 CFR) covers environmental regulations.

**cold vapor atomic absorption**—An analytical technique used for measuring mercury that is described in U.S. Environmental Protection Agency Methods 7470A (“Mercury in Liquid Waste”) and 7471A (“Mercury in Solid or Semisolid Waste”). The technique is based on the absorption of nonionizing radiation at 253.7 nanometers (nm) by mercury vapor. The mercury is reduced to the elemental state and aerated from solution in a closed system. The mercury vapor passes through a cell positioned in the light path of an atomic absorption spectrophotometer. Absorbance (peak height) is measured as a function of mercury concentration.

**collocated sample**—One of two or more samples collected within close proximity of each other and meant to represent the same immediate area.

**colluvium**—A loose deposit of rock debris accumulated through the action of gravity at the base of a cliff or slope.

**combined percent breakdown (% breakdown )**—The sum of the breakdown percentage of 4,4'-DDT (dichlorodiphenyltrichloroethane) and Endrin. The breakdown of 4,4'-DDT is calculated through the amount of DDD (2,2-bis[para-chlorophenyl]-1,1-dichloroethane) and DDE (dichlorodiphenylethylene) detected in a performance evaluation mixture (PEM). The breakdown of Endrin is calculated through the amount of Endrin aldehyde and Endrin ketone in the PEM. The sum of these percentage breakdown values is the combined percent breakdown.

**comment period**—The time provided for the public to review and comment on a regulation action or rule-making after it has been published.

**communication tracker (CT) number**—A unique number assigned by the Environmental Remediation and Surveillance Program office to all incoming correspondence that needs a response (e.g., a notice of disapproval or request for supplemental information).

**community**—In ecology, an assemblage of populations of different species within a specified location in space and time. Sometimes, a particular subgrouping may be specified, such as the fish community in a lake or the soil arthropod community in a forest.

**comparability**—A qualitative measure of the degree to which one item or data set can be compared with another.

**Compliance Order on Consent (Consent Order)**—For the Environmental Remediation and Surveillance Program, an enforcement document signed by the New Mexico Environment Department, the U.S. Department of Energy, and the Regents of the University of California on March 1, 2005, which prescribes the requirements for corrective action at Los Alamos National Laboratory. The purposes of the Consent Order are (1) to define the nature and extent of releases of contaminants at, or from, the facility; (2) to identify and evaluate, where needed, alternatives for corrective measures to clean up contaminants in the environment and prevent or mitigate the migration of contaminants at, or from, the facility; and (3) to implement such corrective measures. The Consent Order supersedes the corrective action requirements previously specified in Module VIII of the Laboratory's Hazardous Waste Facility Permit.

**composite sample**—A sample collected over a temporal or spatial range that typically consists of a series of discrete equal samples that have been combined.

**conceptual hydrogeologic model**—An approximation of the occurrence, movement, and quality of groundwater in a given area and the relationship of that groundwater to the surface water, soil water, and geologic framework in that area.

**conceptual model**—See site conceptual model.

**confined**—Pertaining to groundwater in an artesian aquifer.

**confluence**—A place where two or more streams or canyons meet; the point where a tributary meets the main stream.

**Consent Order**—See Compliance Order on Consent.

**consolidated unit**—A group of solid waste management units (SWMUs), or SWMUs and areas of concern, which generally are geographically proximate and have been combined for the purposes of investigation, reporting, or remediation.

**construction worker scenario**—A land-use condition that evaluates exposures to a human receptor throughout a construction project. The activities typically involve substantial short-term on-site exposures.

**contaminant**—(1) Chemicals and radionuclides present in environmental media or on debris above background levels. (2) According to the March 1, 2005, Compliance Order on Consent (Consent Order), any hazardous waste listed or identified as characteristic in 40 Code of Federal Regulations (CFR) 261 (incorporated by 20.4.1.200 New Mexico Administrative Code [NMAC]); any hazardous constituent listed in 40 CFR 261 Appendix VIII (incorporated by 20.4.1.200 NMAC) or 40 CFR 264 Appendix IX (incorporated by 20.4.1.500 NMAC); any groundwater contaminant listed in the Water Quality Control Commission (WQCC) Regulations at 20.6.3.3103 NMAC; any toxic pollutant listed in the WQCC Regulations at 20.6.2.7 NMAC; explosive compounds; nitrate; and perchlorate. (Note: Under the Consent Order, the term “contaminant” does not include radionuclides or the radioactive portion of mixed waste.)

**continuing calibration**—A combination of calibration blank and check standards used to determine if an instrument’s response to an analyte concentration is within acceptable bounds relative to its initial calibration. A continuing calibration is performed every 12 h of operation or every 10 injections, depending on the analytical test method, thus verifying the satisfactory performance of an instrument on a day-to-day basis. The continuing-calibration 12-h period assumes that the instrument has not been shut down since the initial calibration.

**contract analytical laboratory**—An analytical laboratory under contract to the University of California to analyze samples from work performed at Los Alamos National Laboratory.

**contractor-specific logging procedures (CSLPs)**—The documents supplied by a logging contractor and approved by a project leader for borehole geophysics before a contract is awarded. CSLPs define the detailed procedures by which a given logging system will be calibrated and operated to achieve the objectives for the data type and quality given in the borehole logging technical specifications.

**contract-required detection limit (CRDL)**—The minimum reporting limits required under a contract between Los Alamos National Laboratory and a contract laboratory. The CRDLs are not necessarily intrinsically tied to instrument sensitivity; rather they are reporting limits.

**controlled area**—An indoor or outdoor Los Alamos National Laboratory area to which access is controlled for security reasons or for the protection of individuals from exposure to radiation and/or hazardous materials.

**corrective action**—(1) In the Resource Conservation and Recovery Act, an action taken to rectify conditions potentially adverse to human health or the environment. (2) In the quality assurance field, the process of rectifying and preventing nonconformances.

**corrective measure**—An action taken at a solid waste management unit or area of concern to protect human health or the environment in the event of a release of contaminants into the environment, or to prevent a release of contaminants into the environment.

**corrective measure evaluation**—An evaluation of potential remedial alternatives undertaken to identify a preferred remedy that will be protective of human health and the environment and that will attain appropriate cleanup goals.

**corrective measures implementation plan**—A detailed plan and specifications to implement an approved remedy at a facility. The corrective measures implementation plan is the third step in the corrective action process and includes the design, construction, maintenance, and monitoring of the chosen remedy.

**corrective measures study**—A formal process for identifying and evaluating alternative remedies for releases at a facility.

**cumulative risk**—The evaluation of a simultaneous exposure of a receptor to multiple media, pathways, and contaminants in order to estimate the resulting health and environmental effects.

**Curie**—A unit of radioactivity defined as the quantity of any radioactive nuclide that has an activity of  $3.7 \times 10^{10}$  disintegrations per second (dps).

**cutter head**—An auger bit that is attached to the leading auger flight section and cuts a hole for the auger to follow. The bit may be either a coring head or a full-face bit.

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**daily calibration**—The combination of a calibration blank and calibration standard used to determine if the instrument response to an analyte concentration is within acceptable bounds relative to the initial calibration. A daily calibration establishes the instrument response factors on which quantitations are based, thus verifying the satisfactory performance of an instrument on a day-to-day basis.

**data package**—The hard copy deliverable for each sample delivery group produced by a contract analytical laboratory in accordance with the statement of work for analytical services.

**data-quality assessment**—The statistical and/or scientific evaluation of a data set that establishes whether the data set is adequate for its intended use.

**data-quality objectives**—Qualitative and quantitative statements of the overall level of uncertainty that a decision maker will accept regarding results or decisions based on environmental data. The objectives provide the statistical framework for planning and managing environmental data operations that will meet user needs.

**data validation**—A systematic process that applies a defined set of performance-based criteria to a body of data and that may result in the qualification of the data. The data-validation process is performed independently of the analytical laboratory that generates the data set and occurs before conclusions are drawn from the data. The process may include a standardized data review (routine data validation) and/or a problem-specific data review (focused data validation).

**data verification**—The process of evaluating the completeness, correctness, consistency, and compliance of a laboratory data package against a specified standard or contract.

- Completeness: All required information is present—in both hard copy and electronic forms.
- Correctness: The reported results are based on properly documented and correctly applied algorithms.
- Consistency: The values are the same when they appear in different reports or are transcribed from one report to another.
- Compliance: The data pass numerical quality-control tests based on parameters or limits specified in a contract or in an auxiliary document.

**decision-level concentration**—The concentration at which a 5% probability exists of reporting a false positive for a sample that contains no analytes.

**decision peer review**—A technical (subject-matter-expert) review that occurs before document writing has begun. The focus of the decision peer review is on the appropriateness of the stated objectives for the identified problem, on the adequacy of the proposed approach to address the objectives, and on the identification of concerns and necessary contingencies. Any decision that is expected to lead to the writing of a peer-reviewed document is subject to a decision peer review and falls under Quality Procedure 3.5, Peer Review Process.

**decommissioning**—The permanent removal of facilities and their components from service after the discontinued use of structures or buildings that are deemed no longer useful. Decommissioning must take place in accordance with regulatory requirements and applicable environmental policies.

**decontamination**—The removal of unwanted material from the surface of, or from within, another material.

**deferred action**—The postponement of the selection and implementation of a corrective measure.

**desk instruction**—A document that describes the process for performing administrative activities (except those governed by the Environmental Remediation and Surveillance Program's Quality Management Plan).

**detect (detection)**—An analytical result, as reported by an analytical laboratory, that denotes a chemical or radionuclide to be present in a sample at a given concentration.

**detection limit**—The minimum concentration that can be determined by a single measurement of an instrument. A detection limit implies a specified statistical confidence that the analytical concentration is greater than zero.

**detector background**—The ambient signal response recorded by radioactivity-measuring instruments that is independent of radioactivity contributed by the radionuclides being measured in the sample.

**dilution attenuation factor**—The ratio of contaminant concentration in soil leachate to the concentration in groundwater at a receptor point. The factor is used to account for the dilution of soil leachate in an aquifer.

**discharge**—The accidental or intentional spilling, leaking, pumping, pouring, emitting, emptying, or dumping of hazardous waste into, or on, any land or water.

**disposal**—The discharge, deposit, injection, dumping, spilling, leaking, or placing of any solid waste or hazardous waste into, or on, any land or water so that such solid waste or hazardous waste or any constituent thereof may enter the environment or be emitted into the air or discharged into any waters, including groundwaters.

**dissolved oxygen**—The amount of oxygen dissolved in water, in parts per million (ppm) by weight or in milligrams per liter (mg/L) by volume.

**document catalog number**—A unique document identifier designed to track every document generated by the Environmental Remediation and Surveillance Program. (This number is automatically assigned when an online document signature form is obtained.)

**document control**—The process of ensuring that documents are reviewed for adequacy, approved for release by authorized personnel, and distributed to, and used at, the location where the prescribed activity is to be performed.

**document peer review**—A technical, regulatory, and legal review of a final, professionally edited document. Before the peer review, the document should receive a Level 3 (full) edit as defined by Los Alamos National Laboratory's Communication Arts and Services (IM-1) Group. Because this review follows the decision peer review, the approach should already have been agreed upon. Thus, the primary focus of a document peer review is on content (and to a lesser extent



on approach; the clarity of presentation; and a consistent, appropriate format). The document peer review may be either a panel review or a read review. Quality Procedure 4.9 (Document Development and Approval Process) lists the types of Environmental Remediation and Surveillance Program documents that require a formal peer review.

**dose (dosage)**—(1) The actual quantity of a chemical that is administered to an organism or to which it is exposed. (2) The amount of a substance that reaches a specific tissue (e.g., the liver). (3) The amount of a substance that is available for interaction with metabolic processes after it has crossed an organism's outer boundary.

**dose equivalent**—The product of the absorbed dose from ionizing radiation and factors that account for biological differences as a result of the radiation type and its distribution in the body.

**double-blind sample**—A performance-evaluation sample whose analyte concentrations and sample identity are unknown to the analyst (i.e., the analyst is not informed that the sample is a performance-evaluation sample).

**drill bit**—The cutting tool attached to the bottom of a drill stem.

**drilling fluid**—The fluid used to lubricate a bit and to convey drill cuttings to the surface with rotary drilling equipment. Usually composed of bentonite slurry or muddy water. The fluid can become contaminated, lead to cross-contamination, and may require special disposal.

**drilling package**—A document package that includes a detailed drilling plan, curation plan, sampling and analysis plan (SAP), and geophysical logging plan, as necessary, to meet the sampling requirements defined in the site-specific SAP for a given operable unit.

**drilling string**—The string of pipe (extending from the bit to the driving mechanism) that serves to carry mud down a borehole and to rotate a bit.

**drill rod (drill pipe)**—Special pipe used to transmit rotation and energy from the drill rig to the bit. This conduit conveys circulation fluids such as air, water, or other mixtures to cool the bit and evacuate the borehole cuttings.

**duplicate analysis**—An analysis performed on one member of a pair of identically prepared subsamples taken from the same sample.

**duplicate measurement**—An additional measurement performed on a prepared sample under identical conditions to evaluate any variance in measurement.

## **E**     [\(Back to top\)](#)

**ecological screening levels**—Soil, sediment, or water concentrations that are used to screen for potential ecological effects. The concentrations are based on a

chemical's no-observed-adverse-effect level for a receptor, below which no risk is indicated.

**effluent**—Wastewater (treated or untreated) that flows out of a treatment plant, sewer, or industrial outfall. Generally refers to wastes discharged into surface waters.

**end state**—The physical state of a site after agreed-upon remediation activities have been completed.

**environmental assessment**—An environmental analysis that is prepared, pursuant to the National Environmental Policy Act, to determine whether a particular federal action would significantly affect the environment and thus require a more detailed environmental impact statement.

**environmental impact statement (EIS)**—A document required of federal agencies by the National Environmental Policy Act when those agencies are considering major projects or legislative proposals that could significantly affect the environment. Designed as a decision-making tool, an EIS describes the positive and negative effects of an undertaking and cites alternative actions.

**Environmental Restoration (ER) Project**—A Los Alamos National Laboratory project established in 1989 as part of a U.S. Department of Energy nationwide program, and precursor of today's Environmental Remediation and Surveillance (ERS) Program. This program is designed (1) to investigate hazardous and/or radioactive materials that may be present in the environment as a result of past Laboratory operations, (2) to determine if the materials currently pose an unacceptable risk to human health or the environment, and (3) to remediate (clean up, stabilize, or restore) those sites where unacceptable risk is still present.

**environmental samples**—Air, soil, water, or other media samples that have been collected from streams, wells, and soils, or other locations, and that are not expected to exhibit properties classified as hazardous by the U.S. Department of Transportation.

**environmental surveillance**—The collection and analysis of samples from air, water, soil, foodstuffs, biota, and other media to determine the environmental quality of an industry or community. Environmental surveillance is performed commonly at sites that contain nuclear facilities.

**eolian**—Pertaining to the geological products of wind action and especially said of sediment deposition by the wind (e.g., eolian sand and eolian dunes).

**ephemeral**—Pertaining to a stream or spring that flows only during, and immediately after, periods of rainfall or snowmelt.

**equipment blank (rinsate blank)**—A sample used to rinse sample-collection equipment and expected to have negligible or unmeasurable amounts of analytes. The equipment blank is collected after the equipment decontamination is completed but before the collection of another field sample.

**ER data**—Data derived from samples that have been collected and paid for through Environmental Remediation and Surveillance Program funding.

**ER database (ERDB)**—A database housing analytical and other programmatic information for the Environmental Remediation and Surveillance Program. The ERDB currently contains about 3 million analyses in 300 tables.

**ER identification (ER ID) number**—A unique identifier assigned by the Environmental Remediation and Surveillance Program's Records Processing Facility to each document when it is submitted as a final record.

**error**—The quantifiable difference between an observed value and the true value of a parameter being measured.

**estimated detection limit**—A reporting limit required by a Los Alamos National Laboratory statement of work for analytical services.

**estimated quantitation limit (EQL)**—The lowest concentration that can be reliably achieved within specified limits of precision and accuracy during routine analytical-laboratory operating conditions. The low point on a calibration curve should reflect this quantitation limit. The EQL is not used to establish detection status. Sample EQLs are highly matrix dependent, and the specified EQLs might not always be achievable.

**evapotranspiration**—(1) The discharge of water from the earth's surface to the atmosphere by evaporation from lakes, streams, and soil surfaces and by transpiration from plants. (2) The loss of water from the soil by evaporation and/or by transpiration from the plants growing in the soil.

**exposure pathway**—Any path from the sources of contaminants to humans and other species or settings through air, soil, water, or food.

**exposure unit**—The bounded area or volume within which a person or other receptor could be exposed to contaminants that have been released into the environment.

**external standard calibration**—A comparison of instrument responses from a sample to the responses from target compounds in the calibration standards. The sample's peak areas (or peak heights) are compared to the standards' peak areas (or peak heights).

## **F** ([Back to top](#))

**facility**—All contiguous land (and structures, other appurtenances, and improvements on the land) used for treating, storing, or disposing of hazardous waste. A facility may consist of several treatment, storage, or disposal operational units. For the purpose of implementing a corrective action, a facility is all the contiguous property that is under the control of the owner or operator seeking a permit under Subtitle C of the Resource Conservation and Recovery Act.

**fallout radionuclides**—Radionuclides that are present at globally elevated levels in the environment as a result of fallout from world-wide atomic weapons tests. The Los Alamos National Laboratory (the Laboratory) background data sets consist of environmental surveillance samples taken from marginal and regional locations for the following radionuclides associated with fallout: tritium, cesium-137, americium-241, plutonium-238, plutonium-239/240, and strontium-90. Samples were collected from regional and marginal locations in the Laboratory's vicinity that were (1) representative of geological media found within Laboratory boundaries, and (2) were not impacted by Laboratory operations.

**fault**—A fracture, or zone of fractures, in rock along which vertical or horizontal movement has taken place and adjacent rock layers or bodies have been displaced.

**Federal Register**—The official daily publication for Rules, Proposed Rules, and Notices from federal agencies and organizations, as well as Executive Orders and other presidential documents.

**field blank (field reagent blank)**—A blank sample prepared in the field or carried to the sampling site, exposed to sampling conditions (e.g., by removing bottle caps), and returned to a laboratory to be analyzed in the same manner in which environmental samples are being analyzed. Field blanks are used to identify the presence of any contamination that may have been added during the sampling and analysis process.

**field duplicate (replicate) samples**—Two separate, independent samples taken from the same source, which are collected as collocated samples (i.e., equally representative of a sample matrix at a given location and time).

**field matrix spike**—A known amount of a field sample to which a known amount of a target analyte has been added and used to compute the proportion of the added analyte that is recovered upon analysis.

**field notebook**—A record of activities performed in the field or a compilation of field data.

**field reagent blank**—See field blank.

**field sample**—See sample.

**field split sample**—A field sample that has been homogenized and divided, in the field, into equally representative portions that are submitted for analysis.

**filter pack**—Sand, gravel, or glass beads that are uniform, clean, and well rounded and are placed in the annulus of a well, between the borehole wall and the well intake, to stabilize the formation and to prevent foreign material from entering through the well intake.

**flood plain**—The flat, or nearly flat, land along a river or stream, or in a tidal area, that is covered by water during a flood.

**fluid invasion**—The migration of a drilling fluid, or one or more components of a drilling fluid, into the pores, fractures, or other openings in a formation near a borehole.

**focused data validation**—A technically based analyte-, sample-, and data-use-specific process that extends the qualification of data beyond the method or contractual compliance and provides a higher level of confidence that an analyte is present or absent. If an analyte is present, the quality of the quantitation may be obtained through focused validation.

**formal training**—Training that is conducted by a qualified individual in settings such as a classroom or the field.

## **G** ([Back to top](#))

**gamma radiation**—A form of electromagnetic, high-energy ionizing radiation emitted from a nucleus. Gamma rays are essentially the same as x-rays (though at higher energy) and require heavy shielding, such as concrete or steel, to be blocked.

**geohydrology**—The science that applies hydrologic methods to the understanding of geologic phenomena.

**grab sample**—A specimen collected by a single application of a field sampling procedure to a target population (e.g., the surface soil from a single hole collected after the spade-and-scoop sampling procedure, or a single air filter left in the field for three months).

**graded approach**—A management tool used to evaluate the importance and relative risk of an item, activity, or service in the working process.

**gravimetric moisture content**—See water content.

**ground cover**—Natural or human-made materials (e.g., grasses, pine needles, asphalt, or concrete) which overlay soils.

**groundwater**—Interstitial water that occurs in saturated earth material and is capable of entering a well in sufficient amounts to be used as a water supply.

**grout**—Cement or bentonite mixtures used for sealing boreholes and wells and for zone isolation. Only Portland Type I or II cement is approved for use at investigative sites.

**gully erosion**—The erosion process whereby water accumulates in narrow channels and, over short periods, removes soil from these narrow areas to considerable depths (1 ft to 50 ft).

## H [\(Back to top\)](#)

**half-life**—(1) The time required for a pollutant to lose one-half of its original concentration (for example, the biochemical half-life of DDT [dichlorodiphenyltrichloroethane] in the environment is 15 yr). (2) The time required for one half of the atoms in a radioactive element to undergo self-transmutation or decay (the half-life of radium is 1620 yr). (3) The time required for the elimination of one half of a total dose from the body.

**hazard index**—The sum of hazard quotients for multiple contaminants to which a receptor may have been exposed.

**Hazardous and Solid Waste Amendments (HSWA)**—Public Law No. 98-616, 98 Stat. 3221, enacted in 1984, which amended the Resource Conservation and Recovery Act of 1976 (42 United States Code § 6901 et seq).

**hazardous constituent (hazardous waste constituent)**—According to the March 1, 2005, Compliance Order of Consent (Consent Order), any constituent identified in Appendix VIII of Part 261, Title 40 Code of Federal Regulations (CFR) (incorporated by 20.4.1.200 New Mexico Administrative Code [NMAC]) or any constituent identified in 40 CFR 264, Appendix IX (incorporated by 20.4.1.500 NMAC).

**hazardous samples**—Samples of on-site air particulates, soil, or water and materials collected at waste sites that are known, or thought, to meet the definition of a hazard class per 49 Code of Federal Regulations 171.8. The term “hazardous samples” does not refer to Resource Conservation and Recovery Act hazardous wastes unless so stated.

**hazardous waste**—(1) Solid waste that is listed as a hazardous waste, or exhibits any of the characteristics of hazardous waste (i.e., ignitability, corrosivity, reactivity, or toxicity, as provided in 40 CFR, Subpart C). (2) According to the March 1, 2005, Compliance Order of Consent (Consent Order), any solid waste or combination of solid wastes that, because of its quantity, concentration, or physical, chemical, or infectious characteristics, meets the description set forth in New Mexico Statutes Annotated 1978, § 74-4-3(K) and is listed as a hazardous waste or exhibits a hazardous waste characteristic under 40 CFR 261 (incorporated by 20.4.1.200 New Mexico Administrative Code).

**Hazardous Waste Bureau**—The New Mexico Environment Department bureau charged with providing regulatory oversight and technical guidance to New Mexico hazardous waste generators and to treatment, storage, and disposal facilities, as required by the New Mexico Hazardous Waste Act.

**Hazardous Waste Facility Permit**—The authorization issued to Los Alamos National Laboratory (the Laboratory) by the New Mexico Environment Department that allows the Laboratory to operate as a hazardous waste treatment, storage, and disposal facility.

**hazard quotient (HQ)**—The ratio of the estimated site-specific exposure concentration of a single chemical from a site to the estimated daily exposure level at which no adverse health effects are likely to occur.

**high-explosive wastes**—Any waste-containing material having an amount of stored chemical energy that could start a violent reaction when initiated by impact, spark, or heat. This violent reaction would be accompanied by a strong shock wave and the potential for high-velocity particles to be propelled.

**holding time**—The maximum elapsed time a sample can be stored without unacceptable changes in analyte concentrations. Holding times apply under prescribed conditions, and deviations from these conditions may affect the holding times. Extraction holding time refers to the time lapsed between sample collection and sample preparation. Analytical holding time refers to the time lapsed between sample preparation and analysis.

**HSWA module**—See Module VIII.

**hydraulic conductivity**—(1) A coefficient of proportionality that describes the rate at which a fluid can move through a permeable medium. The rate is a function of both the medium and the fluid flowing through it. (2) The quantity of water that will flow through a unit of cross-sectional area of a porous material per unit time under a hydraulic gradient of 1.00 (measured at right angles to the direction of flow) at a specified temperature.

**hydraulic gradient**—The rate of change in hydraulic head per unit of distance in the direction of groundwater flow.

**hydraulic head**—The elevation of the water table or potentiometric surface as measured in a well.

**hydrogen-ion activity (pH)**—The effective concentration (activity) of dissociated hydrogen ions ( $H^+$ ); a measure of the acidity or alkalinity of a solution that is numerically equal to 7 for neutral solutions, increases with alkalinity, and decreases as acidity increases.

**“Hydrogeologic Workplan”**—The document that describes the activities planned by Los Alamos National Laboratory (the Laboratory) to characterize the hydrologic setting beneath the Laboratory and to enhance the Laboratory’s groundwater monitoring program.

**hydrogeology**—The science dealing with the occurrence of surface water and groundwater, their uses, and their functions in modifying the earth, primarily by erosion and deposition.

**hypothesis**—A tentative explanation that accounts for a set of data and that can be tested by further investigation.

## I [\(Back to top\)](#)

**imminent danger**—Conditions or practices in the workplace that could reasonably be expected to cause immediate death or serious physical harm if they are not eliminated.

**independent quality assessment**—A planned and documented activity performed by individuals outside the Environmental Remediation and Surveillance (ERS) Program to determine—by investigation, examination, or evaluation of objective evidence—the extent to which the ERS quality program is being implemented.

**inductively coupled plasma emission spectroscopy**—A method that detects trace elements (including metals) in solutions by measuring characteristic emission spectra through optical spectrometry. Samples are nebulized, and the resulting aerosol is transported to a plasma torch. Element-specific emission spectra are produced by a radio-frequency, inductively coupled plasma. The spectra are dispersed by a grating spectrometer, and photosensitive devices are used to monitor the emission lines' intensities.

**inductively coupled plasma mass spectrometry**—A method that detects sub-microgram/liter concentrations of a large number of elements in water samples and in waste extracts or digests. When dissolved constituents are required, samples must be filtered and acid-preserved before analysis. No digestion is required before analysis for dissolved elements in water samples. The method measures ions produced by a radio-frequency, inductively coupled plasma. Analyte species originating in a liquid are nebulized, and the resulting aerosol is transported by argon gas into a plasma torch. The ions produced in the plasma gas are introduced into a mass spectrometer by means of an interface. The ions produced in the plasma are sorted according to their mass-to-charge ratios and quantified with a channel electron multiplier or Faraday cup.

**industrial scenario**—A land-use condition in which current Los Alamos National Laboratory operations or industrial/commercial operations within Los Alamos County are continued or planned. Any necessary remediation involves cleanup to standards designed to ensure a safe and healthy work environment for workers.

**infiltration**—(1) The penetration of water through the ground surface into subsurface soil. (2) The technique of applying large volumes of wastewater to land to penetrate the surface and percolate through the underlying soil.

**initial calibration**—The process used to establish the relationship between instrument response and analyte concentration at several analyte concentration values in order to demonstrate that an instrument is capable of acceptable analytical performance.

**injection well**—A well into which fluids are injected for purposes such as waste disposal, improving the recovery of crude oil, or solution mining.



**innovative technologies**—New or inventive methods for effectively treating hazardous waste and reducing risk to human health and the environment.

**inspection**—The critical examination or measurement of an item or activity to determine its conformance to applicable quality standards or specifications.

**institutional controls**—Controls that prohibit or limit access to contaminated media. Institutional controls may include use restrictions, permitting requirements, standard operating procedures, laboratory implementation requirements, laboratory implementation guidance, and laboratory performance requirements.

**instrument detection limit (IDL)**—A measure of instrument sensitivity without any consideration for contributions to the signal from reagents. The IDL is calculated as follows: Three times the average of the standard deviations obtained on three nonconsecutive days from the analysis of a standard solution, with seven consecutive measurements of that solution per day. The standard solution must be prepared at a concentration of three to five times the instrument manufacturer's estimated IDL.

**instrument drift**—A systematic change in a given logging system's output as a result of causes inherent in the logging system, such as changing tool temperature or the deterioration of an electronic component.

**instrument performance check**—The analysis of a chemical of known relative mass abundances to indicate how well a mass spectrometer is performing over a specified mass range.

**interflow**—A runoff process that involves lateral subsurface flow within the soil zone.

**interim measure**—An action that can be implemented to minimize or prevent the migration of contaminants and to minimize or prevent actual or potential human or ecological exposure to contaminants, while long-term final corrective action remedies are evaluated and, if necessary, implemented.

**intermittent stream**—A stream that flows only in certain reaches as a result of the channel bed's losing and gaining characteristics.

**internal standards**—Compounds added to a sample after the sample has been prepared for qualitative and quantitative instrument analysis. The compounds serve as a standard of retention time and response that is invariant from run to run.

**interrupted stream**—A stream whose flow is discontinuous as a result of human-made structures.

**investigation-derived waste**—Solid waste or hazardous waste that was generated as a result of corrective action investigation or remediation field activities. Investigation-derived waste may include drilling muds, cuttings, and purge water from the installation of test pits or wells; purge water, soil, and other materials from the collection of samples; residues from the testing of treatment technologies and

pump-and-treat systems; contaminated personal protective equipment; and solutions (aqueous or otherwise) used to decontaminate nondisposable protective clothing and equipment.

## **L** ([Back to top](#))

**laboratory control sample (LCS)**—A known matrix that has been spiked with compound(s) representative of target analytes. LCSs are used to document laboratory performance, and the acceptance criteria for LCSs are method-specific.

**laboratory qualifier (laboratory flag)**—Codes applied to data by a contract analytical laboratory to indicate, on a gross scale, a verifiable or potential data deficiency. These flags are applied according to the U.S. Environmental Protection Agency contract-laboratory program guidelines.

**land disposal**—Placement in or on the land, except in a corrective-action management unit or staging pile; this includes, but is not limited to, placement in a landfill, surface impoundment, waste pile, injection well, or land treatment facility.

**land-disposal restrictions**—Requirements in Title 40 Code of Federal Regulations, Section 268 that specify treatment standards that protect human health and the environment when hazardous waste is land disposed. All hazardous waste, except under certain limited circumstances, must meet a specific treatment standard before it can be land disposed.

**LANL (Los Alamos National Laboratory) data validation qualifiers**—The Los Alamos National Laboratory data qualifiers which are defined by, and used, in the Environmental Remediation and Surveillance (ERS) Program validation process. The qualifiers describe the general usability (or quality) of data. For a complete list of data qualifiers applicable to any particular analytical suite, consult the appropriate ERS standard operating procedure.

**LANL (Los Alamos National Laboratory) data validation reason codes**—The Los Alamos National Laboratory designations applied to sample data by data validators who are independent of the contract laboratory that performed a given sample analysis. Reason codes provide an analysis-specific explanation for applying a qualifier, with some description of the qualifier's potential impact on data use. For a complete list of data qualifiers applicable to any particular analytical suite, consult the appropriate Environmental Remediation and Surveillance Program standard operating procedure.

**leachate**—Water that collects contaminants as it trickles through wastes, pesticides, or fertilizers. Leaching may occur in farming areas, feedlots, and landfills, and may result in hazardous substances entering surface water, groundwater, or soil.

**leaching**—The process by which soluble constituents are dissolved and filtered through the soil by a percolating fluid.

**log book**—A notebook used to record tabulated data (e.g., the history of calibrations, sample tracking, numerical data, or other technical data).

**logging run**—A single data-collecting pass with a logging tool as the tool moves up or down in the borehole or a portion of the borehole. A logging operation generally consists of a main run and one or more repeat runs with each logging tool.

**logging tool**—A device that is run in a borehole to make borehole logging measurements.

**logging tool stack**—Two or more logging tools attached together and run as a single unit to save time and to improve the depth correlation between logs.

**log header**—One or more pages of information included with each hard copy of borehole logging data and with logging data recorded digitally on magnetic tapes or disks. The minimum information required in the log header is specified in the borehole logging technical specifications and includes such information as name and location of the hole, the logging services performed, and the date and time of the log's beginning and end.

**long-term environmental stewardship**—All the activities required to maintain an adequate level of protection for human health and the environment from risks posed by nuclear and/or chemical materials, waste, and contamination that remain after cleanup is complete.

**Los Alamos unlimited release (LA-UR) number**—A unique identification number required for all documents or presentations prepared for distribution outside Los Alamos National Laboratory (the Laboratory). LA-UR numbers are obtained by filling out a technical information release form (<http://enterprise.lanl.gov/alpha.htm>) and submitting the form together with 2 copies of the document to the Laboratory's Classification Group (S-7) for review.

**lower acceptance limit (LAL)**—The lowest limit that is acceptable according to quality control (QC) criteria for a specific QC sample and for a specific method. Any results lower than the LAL are qualified following the routine validation procedure.

## **M** ([Back to top](#))

**material disposal area (MDA)**—A subset of the solid waste management units at Los Alamos National Laboratory (the Laboratory) that include disposal units such as trenches, pits, and shafts. Historically, various disposal areas (but not all) were designated by the Laboratory as MDAs.

**matrix**—Relatively fine material in which coarser fragments or crystals are embedded; also called “ground mass” in the case of igneous rocks.

**matrix spike**—An aliquot of a sample to which a known concentration of target analyte has been added. Matrix spike samples are used to measure the ability to recover

prescribed analytes from a native sample matrix. The spiking typically occurs before sample preparation and analysis.

**matrix spike duplicate**—An intralaboratory duplicate sample to which a known amount of target analyte has been added. Spiking typically occurs before sample preparation and analysis.

**maximum contaminant level (MCL)**—Under the Safe Drinking Water Act, the maximum permissible level of a contaminant in water that is delivered to any user of a public water system serving 15 or more connections and 25 or more people. MCLs are enforceable standards and take into account the feasibility and cost of attaining the standards.

**measuring and test equipment**—Devices or systems used to calibrate, measure, gauge, test, or inspect entities to control or acquire data and verify conformance to specified requirements.

**medium (environmental)**—Any material capable of absorbing or transporting constituents. Examples of media include tuffs, soils and sediments derived from these tuffs, surface water, soil water, groundwater, air, structural surfaces, and debris.

**medium (geological)**—The solid part of the hydrogeological system; may be unsaturated or saturated.

**method blank**—An analyte-free matrix to which all reagents are added in the same volumes or proportions as those used in the environmental sample processing, and which is prepared and analyzed in the same manner as the corresponding environmental samples. The method blank is used to assess the potential for sample contamination during preparation and analysis.

**method detection limit (MDL)**—The minimum concentration of a substance that can be measured and reported with a known statistical confidence that the analyte concentration is greater than zero. After subjecting samples to the usual preparation, the MDL is determined by analyzing those samples of a given matrix type that contain the analyte. The MDL is used to establish detection status.

**migration**—The movement of inorganic and organic chemical species through unsaturated or saturated materials.

**migration pathway**—A route (e.g., a stream or subsurface flow path) for the potential movement of contaminants to environmental receptors (plants, humans, or other animals).

**minimum detectable activity (MDA)**—For the analysis of radionuclides, the lowest detectable radioactivity for a given analytical technique. The following equation is used to calculate the MDA unless otherwise noted or approved by Los Alamos National Laboratory. (Note: “MDA” here should not to be confused with material disposal area):

$$\text{MDA} = \frac{4.65(\text{BKG})^{0.5} + 2.71}{2.22 \times \text{EFF} \times V \times T_s \times Y} ,$$

where BKG = the total background counts,

EFF = the fraction detector efficiency,

V = the volume or unit weight,

T<sub>s</sub> = the sample count duration, and

Y = the fractional chemical recovery obtained from the tracer recovery.

Depending on the type of analysis, other terms may also be required in the denominator (e.g., gamma abundance).

**mitigation**—(1) Minimizing environmental impacts by limiting the degree or magnitude of an action and its implementation, (2) Rectifying an environmental impact by repairing, rehabilitating, or restoring the affected environment, (3) Reducing or eliminating an environmental impact over time by preservation and maintenance operations during the life of the action, (4) Compensating for an environmental impact by replacing or providing substitute resources or environments.

**mixed waste**—Waste containing both hazardous and source, special nuclear, or byproduct materials subject to the Atomic Energy Act of 1954.

**model**—A schematic description of a physical, biological, or social system, theory, or phenomenon that accounts for its known or inferred properties and may be used for the further study of its characteristics.

**Module VIII**—Module VIII of the Los Alamos National Laboratory (the Laboratory) Hazardous Waste Facility Permit. This permit allows the Laboratory to operate as a hazardous-waste treatment, storage, and disposal facility. From 1990 to 2005, Module VIII included requirements from the Hazardous and Solid Waste Amendments. These requirements have been superseded by the March 1, 2005, Compliance Order on Consent (Consent Order).

**monitoring well**—(1) A well used to obtain water-quality samples or to measure groundwater levels, (2) A well drilled at a hazardous waste management facility or Superfund site to collect groundwater samples for the purpose of physical, chemical, or biological analysis and to determine the amounts, types, and distribution of contaminants in the groundwater beneath the site.

**mudcake**—A layer of mud that may be deposited on a borehole wall when a drilling fluid contains mud. When the liquid component of the mud invades a formation, the solid component may be left on the borehole wall.

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**National Pollutant Discharge Elimination System**—The national program for issuing, modifying, revoking and reissuing, terminating, monitoring, and enforcing permits to discharge wastewater or storm water, and for imposing and enforcing pretreatment requirements under the Clean Water Act.

**neutralize**—To render a toxic chemical agent harmless by chemical action.

**no further action**—Under the Resource Conservation and Recovery Act, a corrective-action determination whereby, based on evidence or risk, no further investigation or remediation is warranted.

**nonconformance**—Any deficiency in a physical characteristic, documentation, or procedure that renders the quality of an item or service unacceptable or indeterminate.

**nonconformance code**—A code that identifies the type of nonconformance and the associated process, activity, or application.

**nonconsumable calibration standards**—Standards that are not used up over a period of time and may require calibration (e.g., weight sets, thermocouples, and thermometers).

**nondetect**—A result that is less than the method detection limit.

**non-ER data**—Data derived from samples collected by, and paid for by, sources other than the Environmental Remediation and Surveillance Program.

**notice of deficiency**—A written notification from the administrative authority to a facility owner/operator following the review of a permit application or other permit-related plan or report. A notice of deficiency requests additional information before a decision can be made regarding the original plan or report.

**notices of approval, of approval with modification, or of disapproval**—Notices issued by the New Mexico Environment Department (NMED). Upon receipt of a work plan, schedule, report, or other deliverable document, NMED reviews the document and approves the document as submitted, modifies the document and approves it as modified, or disapproves the document. A notice of approval means that the document is approved as submitted. A notice of approval with modifications means that the document is approved but with modifications specified by NMED. A notice of disapproval means that the document is disapproved and it states the deficiencies and other reasons for disapproval.

## O [\(Back to top\)](#)

**operable units (OUs)**—At Los Alamos National Laboratory, 24 areas originally established for administering the Environmental Remediation and Surveillance Program. Set up as groups of potential release sites, the OUs were aggregated

according to geographic proximity for the purposes of planning and conducting Resource Conservation and Recovery Act (RCRA) facility assessments and RCRA facility investigations. As the project matured, it became apparent that there were too many areas to allow efficient communication and to ensure consistency in approach. In 1994, the 24 OUs were reduced to 6 administrative field units.

**other regulated material (ORM)**—Material, such as a consumer commodity, that, although otherwise subject to the regulations of Subchapter C of 49 Code of Federal Regulations (CFR) 100, presents a limited hazard during the material's transportation as a result of its form, quantity, or packaging. An ORM must be a material for which exceptions are provided in 49 CFR 172.101.

**outfall**—A place where effluent is discharged into receiving waters.

**out of control**—A condition in which a measured quality control parameter does not meet specified control or acceptance criteria.

**overpumping**—Pumping a well down as low as possible and then allowing it to refill.

## **P**     ([Back to top](#))

**panel review**—A type of decision peer review or document peer review that includes a face-to-face meeting between authors and reviewers for a discussion of issues.

**pedogenic calcite (calcrete)**—An accumulation of calcium carbonate formed by the soil-forming process; typically found in the near surface.

**peer review**—See decision peer review and document peer review.

**percent recovery (%R)**—The amount of material detected in a sample (less any amount already in the sample) divided by the amount added to the sample, expressed as a percentage.

**perched water**—A zone of unpressurized water held above the water table by impermeable rock or sediment.

**percolation**—Gravity flow of soil water through the pore spaces in soil or rock below the ground surface.

**percussion gun**—A device run on a wireline to obtain samples from a borehole wall. On a single run, multiple sample tubes or hollow shells are driven into the borehole wall at various depths by explosives and are retrieved along with the samples.

**perennial stream**—Water in a channel or bed that flows continuously throughout the year.

**performance criteria**—Measurable criteria used to assess all or part of a process.

**performance evaluation**—A type of audit in which quantitative data generated by a measurement system are obtained independently and then compared with routinely obtained data to evaluate the proficiency of an analyst or laboratory.

**performance-evaluation sample**—A sample of known composition with respect to selected analytes, which, upon analysis, is expected to yield results that fall within a prescribed range. Performance-evaluation samples are selected to mimic, as closely as possible, matrices that are representative of environmental samples from a particular location.

**permit**—An authorization, license, or equivalent control document issued by the U.S. Environmental Protection Agency or an approved state agency to implement the requirements of an environmental regulation.

**permit modification**—A change to a condition in a facility's permit, initiated by either a request from the permittee or by the administrative authority's action.

**piedmont**—An area of land formed or lying at the foot of a mountain or mountain range.

**piezometer**—A nonpumping well (generally of small diameter) for measuring the elevation of a water table.

**piezometric surface (potentiometric surface)**—The surface that represents the static head in an aquifer; applies to both confined and unconfined aquifers.

**polychlorinated biphenyls (PCBs)**—Any chemical substance limited to the biphenyl molecule that has been chlorinated to varying degrees, or any combination that contains such substances. PCBs are colorless, odorless compounds that are chemically, electrically, and thermally stable and have proven to be toxic to both humans and other animals.

**population**—(1) A group of interbreeding organisms occupying a particular space.  
(2) The number of humans or other living creatures in a designated area.

**porosity**—The degree to which soil, gravel, sediment, or rock is permeated with pores or cavities through which water or air can move.

**porphyritic**—Pertaining to the texture of an igneous rock in which larger crystals (phenocrysts) are set in a finer ground mass or matrix.

**potential release site**—A term for a potentially contaminated site at Los Alamos National Laboratory that refers to solid waste management units and areas of concern.

**potentiometer**—An instrument that measures an unknown potential difference by comparison to a standard potential difference.

**potentiometric surface**—See piezometric surface.

**Precambrian**—All geologic time before the beginning of the Cambrian period's Paleozoic Era which began about 600 million years ago.

**precision**—The degree of mutual agreement among a series of individual measurements, values, or results.



**preliminary remediation goals**—Acceptable exposure levels (protective of human health and the environment) that are used as a risk-based tool for evaluating remedial alternatives.

**preliminary risk assessment**—A risk assessment that is conducted using conservative assumptions and scenarios and that assumes no mitigating or corrective measures beyond those already in place.

**prepared sample**—A sample that has been treated to render it amenable to analysis. The sample preparation may include additives or treatments such as digestate, distillate, electroplate, extract, filter retentate, filtrate, homogenate, precipitate, pulverized/sieved portion of sample, or residue.

**privileged record**—A record to which access is controlled as a result of statutory, legal, or security requirements.

## Q [\(Back to top\)](#)

**qualifications**—The requisites (e.g., education, training, skills, or experience) that equip an individual for a professional position, such as assessor or lead assessor.

**quality assessment**—A system of activities whose purpose is to provide assurance that overall quality control is being executed effectively. Quality assessment involves a continuing evaluation of a production system's products and performance.

**quality-assessment sample**—A sample submitted for analysis, the data from which are used to assess the performance quality of a sampling or analysis process. May include performance-evaluation samples, field duplicates, or field blanks.

**quality-assurance project plan**—A formal document that describes, in comprehensive detail, the necessary quality assurance, quality control, and other technical activities that must be implemented to ensure that results of work performed will satisfy stated performance criteria.

**quality assurance/quality control**—A system of procedures, checks, audits, and corrective actions set up to ensure that all U.S. Environmental Protection Agency research design and performance, environmental monitoring and sampling, and other technical and reporting activities are of the highest achievable quality.

**quality control**—See quality assurance/quality control.

**quality-control sample**—A specimen that, upon analysis, is intended to provide information that is useful for adjusting, controlling, or verifying the continuing acceptability of sampling and/or analysis activities in progress.

**quality indicators**—Quantitative statistics and qualitative descriptors for interpreting the degree of acceptability or utility of data to the user. Indicators of quality include

precision, bias, representativeness, reproducibility, comparability, and statistical confidence.

**quality level 1**—The highest level assigned to a document or activity. At this level, documents and activities must meet applicable requirements of a quality management plan and/or a quality assurance project plan.

**quality level 2**—A level that is assigned to those documents or activities that require good management, engineering, or laboratory practices, and that may follow the requirements in U.S. Department of Energy orders or the Los Alamos National Laboratory's Laboratory implementation requirements.

**quality management**—The portion of an organization's overall management system that determines and implements the quality policy. Quality management includes strategic planning, allocation of resources, and other systematic activities (e.g., planning implementation and assessment) pertaining to an organization's quality standards.

**quality management plan (QMP)**—A document providing a framework for planning, implementing, and assessing work performed by an organization and for carrying out required quality assurance/quality control. A QMP is part of an organization's structured and documented management system that describes the policies, objectives, principles, organizational authority, responsibilities, accountability, and implementation plan for ensuring quality in work processes, products, and services.

**quality procedure**—A document that describes the process, method, and responsibilities for performing, controlling, and documenting any quality-affecting activity governed by a quality management plan.

**Quaternary**—The second period of the Cenozoic Era, following the Tertiary, and including the last two to three million years of earth history.

## R [\(Back to top\)](#)

**radiation**—A stream of particles or electromagnetic waves emitted by atoms and molecules of a radioactive substance as a result of nuclear decay. The particles or waves emitted can consist of neutrons, positrons, alpha particles, beta particles, or gamma radiation.

**radioactive material**—For purposes of complying with U.S. Department of Transportation regulations, any material having a specific activity (activity per unit mass of the material) greater than 2 nanocuries per gram (nCi/g) and in which the radioactivity is evenly distributed.

**radioactive tracer**—A radionuclide added to, or induced in, a sample for the purpose of monitoring chemical or physical losses of target analytes. The tracer is assumed to behave in the same manner as the target analytes.

**radioactive waste**—Waste that, by either monitoring and analysis, or acceptable knowledge, or both, has been determined to contain added (or concentrated and naturally occurring) radioactive material or activation products, or that does not meet radiological release criteria.

**radioactivity (radioactive decay; radioactive disintegration)**—The spontaneous change in an atom by the emission of charged particles and/or gamma rays.

**radionuclide**—Radioactive particle (human-made or natural) with a distinct atomic weight number.

**RCRA facility assessment (RFA)**—Usually the first step in the Resource Conservation and Recovery Act (RCRA) corrective action process. The RFA includes the identification of potential and actual releases from solid waste management units and preliminary determinations about releases and the need for corrective action and stabilization measures.

**RCRA facility investigation (RFI)**—A Resource Conservation and Recovery Act (RCRA) investigation that determines if a release has occurred and characterizes the nature and extent of contamination at a hazardous waste facility. The RFI is generally equivalent to the remedial investigation portion of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) process.

**reach**—A specific length of a canyon that is treated as a single unit for sampling and analysis. Reaches tend to be internally uniform with respect to geomorphic setting and land use.

**read review**—A review of a written document performed by a reviewer individually (without meeting as a group).

**readiness planning**—The process of identifying, sequencing, and scheduling the preparatory activities for fieldwork to ensure compliance with the applicable Los Alamos National Laboratory, local, state, and federal procedural requirements, standards, and regulations, including those regarding human health and safety and the environment.

**readiness review**—A process to ensure compliance to identified requirements, to document consensus that fieldwork may proceed, and to ensure that the associated activities are closed or scheduled appropriately.

**readiness review checklist**—An itemized guide for readiness planning and readiness review (Quality Procedure 5.3); this checklist is not designed to be comprehensive for all fieldwork.

**reamer**—A type of drill bit that is used specifically for enlarging a borehole.

**receptor**—A person, other animal, plant, or geographical location that is exposed to a chemical or physical agent released to the environment by human activities.

**recharge**—The process by which water is added to a zone of saturation, usually by percolation from the soil surface (e.g., the recharge of an aquifer).

**record**—Any book, paper, map, photograph, machine-readable material, or other documentary material, regardless of physical form or characteristics.

**recreational scenario**—A land-use condition under which individuals may be exposed to contaminants for a limited amount of time as a result of outdoor activities such as hiking, camping, hunting, or fishing.

**redox potential (Eh)**—Chemical reactions whereby a participating element changes its valence state by losing or gaining orbital electrons. This may also be referred to as oxidation-reduction potential.

**reference set**—A hard-copy compilation of reference items cited in Environmental Remediation and Surveillance Program documents.

**regional aquifer**—Geologic material(s) or unit(s) of regional extent whose saturated portion yields significant quantities of water to wells, contains the regional zone of saturation, and is characterized by the regional water table or potentiometric surface.

**regulatory standard**—Media-specific contaminant concentration levels of potential concern that are mandated by federal or state legislation or regulation (e.g., the Safe Drinking Water Act, New Mexico Water Quality Control Commission regulations).

**relative percent difference (RPD)**—The measure used to assess the precision between parent results and their associated duplicate results. The RPD is calculated as follows:

$$|RPD| = \frac{S - R}{\left(\frac{S + R}{2}\right)} 100 ,$$

where RPD = relative percent difference,

S = parent sample result, and

R = duplicate sample result.

The Environmental Remediation and Surveillance Program criteria for the RPD are less than 20% for aqueous samples and less than 35% for soil samples when the sample concentrations are greater than, or equal to, five times the method detection limit (MDL). For samples with concentrations less than five times the MDL, but greater than the MDL, the control is +/-MDL. No precision criterion applies to samples with concentrations less than the MDL.

**release**—Any spilling, leaking, pumping, pouring, emitting, emptying, discharging, injecting, escaping, leaching, dumping, or disposing of hazardous waste or hazardous constituents into the environment.

**remediation**—(1) The process of reducing the concentration of a contaminant (or contaminants) in air, water, or soil media to a level that poses an acceptable risk to human health and the environment. (2) The act of restoring a contaminated area to a usable condition based on specified standards.

**remediation waste**—All solid wastes and hazardous wastes, and all media (including groundwater, surface water, soils, and sediments) and debris, that are managed for implementing cleanup.

**repeat run**—A logging run that may cover only a portion of the depth range of the main logging run and is used to help judge data repeatability, to check on instrument drift, and to detect other data quality problems. The repeat run may be performed before or after the main run.

**replicate measurement**—A reanalysis (remeasurement) of a prepared sample.

**reporting limit (RL)**—The numerical value that an analytical laboratory (in conjunction with its client) selects for determining if a target analyte has been detected. Results below the RL are considered to be undetected, but results above the RL are considered to be detected. The RLs are not necessarily based on instrument sensitivity. RLs can be established at the instrument detection limit, method detection limit, estimated quantitation limit, or contract-required detection limit.

**representativeness**—The degree to which data accurately and precisely represent a characteristic of a population or an environmental condition.

**request for supplemental information**—A request issued by the administrative authority (AA) that states that some aspect(s) of a plan or report does not meet the AA's requirements and that additional information is needed.

**request number**—An identifying number assigned by the Environmental Remediation and Surveillance Program to a group of samples submitted for analysis.

**residential scenario**—The land use condition under which individuals may be exposed to contaminants as a result of living on or near contaminated sites.

**Resource Conservation and Recovery Act**—The Solid Waste Disposal Act as amended by the Resource Conservation and Recovery Act of 1976 (Public Law [PL] 94-580, as amended by PL 95-609 and PL 96-482, United States Code 6901 et seq.).

**restricted area**—Any area to which access is controlled by a licensee to protect individuals from exposure to radiation and radioactive materials. The “restricted area” shall not include areas used as residential quarters, although a separate room or rooms in a residential building may be set apart as a restricted area.

**retardation**—An act or process that reduces the rate of movement of a chemical substance in water relative to the average velocity of the water. The movement of

chemical substances in water can be retarded by adsorption and precipitation reactions, and by diffusion into pore water in a given sedimentary or rock matrix.

**retention time window criteria**—The x-axis on a chromatogram represents retention time. A retention time window is a specified time range on this axis. If a target analyte is detected within its retention time window, it is considered detected. The retention time window criteria are the exact time windows on the chromatogram defining a given target analyte and are method-specific.

**rill erosion**—An erosion process in which numerous small channels several inches deep are formed by concentrated runoff that flows during and immediately after rain storms or snowmelt.

**rinsate blank**—See equipment blank.

**risk**—A measure of the probability that damage to life, health, property, and/or the environment will occur as a result of a given hazard.

**risk analysis**—In the quality assurance field, a qualitative evaluation of the probability and the potential consequences associated with noncompliant documents or work activities.

**risk assessment**—See baseline risk assessment.

**risk-based end state**—The post-remediation vision for the planned future land use of a specific U.S. Department of Energy property.

**risk characterization**—The last phase in the risk assessment process which estimates the potential for adverse health or ecological effects to occur as a result of exposure to a stressor, and which evaluates the uncertainty involved.

**risk management**—The process of evaluating and selecting alternative regulatory and nonregulatory responses to risk. The selection process necessarily requires the consideration of legal, economic, and behavioral factors.

**root cause**—The most basic causal factor(s) that, if corrected or removed, would prevent a situation's recurrence.

**root-cause analysis**—A structured process for identifying the most basic causal factor(s) of a situation.

**routine analysis**—The analysis categories of inorganic compounds, organic compounds, metals, radiochemistry, and high explosives, as defined in a contract laboratory's statement of work.

**routine data**—Data generated using analytical methods that are identified as routine methods in the current Environmental Remediation and Surveillance Program statement of work for analytical services.

**routine data validation**—The process of reviewing analytical data relative to quantitative routine acceptance criteria. The objective of routine data validation is two-fold—

- to estimate the technical quality of the data relative to minimum national standards adopted by the Environmental Remediation and Surveillance Program, and
- to indicate to data users the technical data quality at a gross level by assigning laboratory qualifiers to environmental data whose quality indicators do not meet acceptance criteria.

**runoff**—The portion of the precipitation on a drainage area that is discharged from the area.

**run-on**—Surface water that flows onto an area as a result of runoff occurring higher up on a slope.

## **S**     ([Back to top](#))

**sample**—A portion of a material (e.g., rock, soil, water, or air), which, alone or in combination with other portions, is expected to be representative of the material or area from which it is taken. Samples are typically either sent to a laboratory for analysis or inspection or are analyzed in the field. When referring to samples of environmental media, the term field sample may be used.

**sample matrix**—In chemical analysis, that portion of a sample that is exclusive of the analytes of interest. Together, the matrix and the analytes of interest form the sample.

**screening action level (SAL)**—A radionuclide's medium-specific concentration level; it is calculated by using conservative criteria below which it is generally assumed that no potential exists for a dose that is unacceptable to human health. The derivation of a SAL is based on conservative exposure and on land-use assumptions. However, if an applicable regulatory standard exists that is less than the value derived, it is used in place of the SAL.

**screening risk assessment**—A risk assessment that is performed with few data and many assumptions in order to identify exposures that should be evaluated more carefully for potential risk.

**sediment**—(1) A mass of fragmented inorganic solid that comes from the weathering of rock and is carried or dropped by air, water, gravity, or ice. (2) A mass that is accumulated by any other natural agent and that forms in layers on the earth's surface (e.g., sand, gravel, silt, mud, fill, or loess). (3) A solid material that is not in solution and is either distributed through the liquid or has settled out of the liquid.

**self-study training**—Training that is done on an individual basis, such as reading for comprehension, listening to an audiotope, or viewing a videotape.

**sensitivity**—An indication of the lowest analyte concentration that can be measured with a specified degree of confidence.

**serial dilution sample**—A requirement of the U.S. Environmental Protection Agency (EPA) Method 6010B (Inductively Coupled Plasma-Atomic Emission Spectroscopy). Serial dilutions are made by performing a series of dilutions on an aliquot taken from a stock solution for a target analyte. The first dilution of the original stock solution serves as the stock solution for the second dilution, and the second dilution serves as the stock solution for the third dilution, and so on. To meet the requirement of EPA Method 6010B, one serial dilution analysis must be performed for each matrix in every sample batch, with a minimum of 1 serial dilution sample per 20 samples.

**Shelby tube sampler**—A thin-wall tube sampler that is latched onto a lead auger while hollow-stem augering or pushed/driven ahead of the auger.

**significant condition**—A condition that, if uncorrected, could have a serious effect on quality, project personnel, or public safety, or which could have a major impact on project costs or schedules.

**simple random sample**—A sampling design in which every possible sample (sample unit) has an equal probability of being selected.

**single blind sample**—A performance-evaluation sample submitted for analysis whose sample identity is known to the analyst, but whose composition is known to the submitter and not to the analyst.

**site characterization**—Defining the pathways and methods of migration of hazardous waste or constituents, including the media affected; the extent, direction and speed of the contaminants; complicating factors influencing movement; or concentration profiles.

**site closeout inspection**—An on-site inspection conducted after the completion of fieldwork. The closeout inspection verifies that all fieldwork has been completed and that all compliance issues have been resolved.

**site closeout packet**—Documentation related to fieldwork that includes field logs, waste-management documentation, best management practice (BMP) inspection records, and sample-management records.

**site conceptual model**—A qualitative or quantitative description of sources of contamination, environmental transport pathways for contamination, and receptors that may be impacted by contamination and whose relationships describe qualitatively or quantitatively the release of contamination from the sources, the movement of contamination along the pathways to the exposure points, and the uptake of contaminants by the receptors.

**site-specific health and safety plan (SSHASP)**—A health and safety plan that has been tailored to a site or to an Environmental Remediation and Surveillance (ERS)



Program field activity and that has been approved by an ERS health and safety representative. A SSHASP contains information specific to the project, including the scope of work, relevant history, descriptions of hazards from activity associated with the project site(s), and techniques for exposure mitigation (e.g., personal protective equipment and hazard mitigation).

**slope**—A ratio of units of elevation change to units of horizontal change, usually expressed in degrees.

**soil**—(1) A material that overlies bedrock and has been subject to soil-forming processes. (2) A sample media group that includes naturally occurring and artificial fill materials.

**soil gas**—Gaseous elements and compounds in the small spaces between particles of the earth and soil. Such gases can be moved or driven out under pressure.

**soil hygrometer**—An instrument that measures soil moisture.

**soil moisture**—The water contained in the pore space of the unsaturated zone.

**soil screening level (SSL)**—The concentration of a chemical (inorganic or organic) below which no potential for unacceptable risk to human health exists. The derivation of an SSL is based on conservative exposure and land-use assumptions, and on target levels of either a hazard quotient of 1.0 for a noncarcinogenic chemical or a cancer risk of  $10^{-5}$  for a carcinogenic chemical.

**soil water**—Water in the unsaturated zone, regardless of whether it occurs in soil or rock.

**solid waste**—Any garbage, refuse, or sludge from a waste treatment plant, water-supply treatment plant, or air-pollution control facility, and other discarded material, including solid, liquid, semisolid, or contained gaseous material resulting from industrial, commercial, mining, and agricultural operations and from community activities. Solid waste does not include solid or dissolved materials in domestic sewage; solid or dissolved materials in irrigation return flows; industrial discharges that are point sources subject to permits under section 402 of the Federal Water Pollution Control Act, as amended; or source, special nuclear, or byproduct material as defined by the Atomic Energy Act of 1954, as amended.

**solid waste management unit (SWMU)**—(1) Any discernible site at which solid wastes have been placed at any time, whether or not the site use was intended to be the management of solid or hazardous waste. SWMUs include any site at a facility at which solid wastes have been routinely and systematically released. This definition includes regulated sites (i.e., landfills, surface impoundments, waste piles, and land treatment sites), but does not include passive leakage or one-time spills from production areas and sites in which wastes have not been managed (e.g., product storage areas). (2) According to the March 1, 2005, Compliance Order on Consent (Consent Order), any discernible site at which solid waste has been placed at any

time, and from which the New Mexico Environment Department determines there may be a risk of a release of hazardous waste or hazardous waste constituents (hazardous constituents), whether or not the site use was intended to be the management of solid or hazardous waste. Such sites include any area in Los Alamos National Laboratory at which solid wastes have been routinely and systematically released; they do not include one-time spills.

**specific (electrical) conductance**—A measure of the ease with which a conduction current flows through a substance under the influence of an applied electric field. Specific conductance is dependant upon the presence of ions (total and relative concentrations, valence, and mobility) and temperature. It is the reciprocal of resistivity and is measured in either siemens (S) or micro-ohms per centimeter ( $\mu\text{ohm/cm}$ ) at 25°C.

**specific yield**—The ratio of the volume of water that a given mass of saturated rock or soil will yield by gravity to the volume of the mass expressed as a percentage (dimensionless).

**split sample**—A sample that has been divided into two or more portions that are expected to be of the same composition; used to characterize within-sample heterogeneity, sample handling, and measurement variability.

**split-spoon sampler**—A hollow, tubular sampling device below a drill stem that is driven by a weight to retrieve soil samples. The core barrel can be opened to remove samples. This is a sampling method commonly used with auger drilling. The split-spoon sampler can be driven into the ground or can be advanced inside hollow-stem augers.

**spring**—Groundwater seeping out of the earth where the water table intersects the ground surface.

**stakeholder**—Any organization, governmental entity, or individual that has a stake in, or may be impacted by, a given approach to environmental regulation, pollution prevention, or energy conservation.

**standard operating procedure**—A document that details the officially approved method(s) for an operation, analysis, or action, with thoroughly prescribed techniques and steps.

**stop work**—A moment in a project's lifespan when all activities that relate to specific functions are discontinued until an unacceptable condition is resolved.

**storage coefficient**—The volume of water an aquifer releases from, or takes into, storage per unit surface area of the aquifer per unit change in head (dimensionless).

**stratification**—The process of separating into layers.

**stratified sample**—A sample that includes one or more specimens from each of several subpopulations within a target population. (Note: If the specimens are selected from within each subpopulation using a simple random sample, the sample is called a stratified random sample.)

**stratigraphy**—The study of the formation, composition, and sequence of sediments, whether consolidated or not.

**subsample**—See aliquot.

**Superfund**—Another term for the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). The two terms are used interchangeably.

**surface sample**—A sample taken at a collection depth that is (or was) representative of the medium's surface during the period of investigative interest. A typical depth interval for a surface sample is 0 to 6 in. for mesa-top locations, but may be up to several feet in sediment-deposition areas within canyons.

**surging**—A well development technique wherein a surge block is alternately lifted and dropped within a borehole, above or adjacent to the screen, to create a strong inward and outward movement of water through the well intake.

**surrogate (surrogate compound)**—An organic compound used in the analyses of organic target analytes that is similar in composition and behavior to the target analytes but is not normally found in field samples. Surrogates are added to every blank and spike sample to evaluate the efficiency with which analytes are being recovered during extraction and analysis.

## T [\(Back to top\)](#)

**tag**—A warning device approved by the Environmental Remediation and Surveillance Program that states

### **DANGER – UNSAFE – DO NOT USE**

and has a means of attachment. The tag is employed to prohibit the use of equipment or materials.

**target analyte**—A chemical or parameter, the concentration, mass, or magnitude of which is designed to be quantified by a particular test method.

**technical area (TA)**—At Los Alamos National Laboratory, an administrative unit of operational organization (e.g., TA-21).

**technical notebook**—A record of the methodology, observations, and results of technical activity investigations.

**tentatively identified compound (TIC)**—A chemical compound detected in a sample that is not a target analyte, internal standard, or surrogate. Up to 30

chromatographic peaks may be subject to mass spectral matching for identification as TICs.

**topography**—The physical or natural features of an object or entity and their structural relationships.

**total propagated uncertainty (TPU)**—The range of concentrations (expressed as  $\pm$  the measured concentration) that includes the theoretical or true concentration of an analyte with a specific degree of confidence. Radiochemical results are required to be accompanied by sample-specific uncertainty bounds that reflect the 67% confidence level (1-sigma TPU). The TPU includes not only the measurement or counting error but the technique-specific error term that includes uncertainty values for each contributing measurement process and a sample-specific contribution reflecting the specific chemical recoveries or detectors used. All radiochemical result uncertainties incorporate terms for technique-related and sample-specific measurement errors.

**toxic pollutant**—A water contaminant or combination of water contaminants in concentration(s) that, upon exposure, ingestion, or assimilation, either directly from the environment or indirectly by ingestion through food chains, will unreasonably threaten to injure the health of humans, or the health of other animals or plants that are commonly hatched, bred, cultivated, or protected for use by humans for food or economic benefit.

**tracer**—A substance, usually a radioactive isotope, that is added to, or induced in, a sample for the purpose of monitoring chemical or physical losses of the target analytes. The tracer is assumed to behave in the same manner as the target analytes.

**transmission loss**—The reduction in surface water flow by seepage into a channel bed.

**transmissivity**—The ability of an aquifer to transmit water.

**transport (transportation)**—(1) The movement of a hazardous waste by air, rail, highway, or water. (2) The movement of a contaminant from a source through a medium to a receptor.

**treatment**—Any method, technique, or process, including elementary neutralization, designed to change the physical, chemical, or biological character or composition of any hazardous waste so as to neutralize such waste, recover energy or material resources from the waste, or to render such waste nonhazardous or less hazardous; safer to transport, store, or dispose of; or amenable for recovery or storage; or reduced in volume.

**treatment, storage, and disposal facility**—An interim-status or permitted facility in which hazardous waste is treated, stored, or disposed.

**tremie pipe**—A small-diameter pipe used to carry sand pack, bentonite, or grouting materials to a borehole's bottom. Materials are pumped under pressure or poured to the hole bottom through the pipe. The pipe is retracted as the annular space is filled.

**trend analysis**—An analytical or graphical representation used to identify the changes in a variable as it is measured over a period of time.

**trip blank**—A sample of analyte-free medium taken from a sampling site and returned to an analytical laboratory unopened, along with samples taken in the field; used to monitor cross contamination of samples during handling and storage both in the field and in the analytical laboratory.

**tuff**—Consolidated volcanic ash, composed largely of fragments produced by volcanic eruptions.

**turbidity (nephelometric)**—A measure of the intensity of light scattered by sample particulates relative to a standard reference suspension. The range of water turbidity is measured between 0 and 40 nephelometric turbidity units (NTU).

## U ([Back to top](#))

**unconfined aquifer**—An aquifer containing water that is not under pressure; the water level in a well is the same as the water table outside the well.

**underflow**—Groundwater flow beneath the bed of a nonflowing stream. Such water is often perched in the channel alluvium atop the bedrock surface.

**underground storage tank**—A tank located at least partially underground and designed to hold gasoline or other petroleum products or chemicals.

**unique identifier**—A word or code that aids in the ability to trace the history, application, or location of an activity, item, datum, or sample using recorded documentation. For Environmental Remediation and Surveillance Program records, a unique identifier is an alphanumeric identifier assigned to a primary record.

**unrestricted area**—Any area, whose access is not controlled by a licensee for purposes of protecting individuals from exposure to radiation and radioactive materials, and any area used for residential quarters.

**unsaturated hydraulic conductivity**—A coefficient that describes the rate at which a fluid can potentially move through a permeable, unsaturated medium.

**unsaturated zone**—The area above the water table where soil pores are not fully saturated, although some water may be present.

**upper acceptance limit (UAL)**—The highest limit that is acceptable, based on the quality control (QC) criteria for a specific QC sample for a specific method. Any results greater than the UAL are qualified.

**upper confidence limit**—The statistic that represents the upper bound of the arithmetic mean (usually 95%) of the measured data and that is used in a risk assessment as the reasonable maximum exposure point concentration.

**upper tolerance limit**—A statistical measure of the upper end of a distribution. The 95th percentile upper tolerance limit, which is the 95% upper percentile of the 95th percentile of the data distribution, is the background value used to represent the background data distribution for an inorganic chemical or naturally occurring radionuclide.

**U.S. Department of Energy**—The federal agency that sponsors energy research and regulates nuclear materials for weapons production.

**U.S. Environmental Protection Agency (EPA)**—The federal agency responsible for enforcing environmental laws. Although state regulatory agencies may be authorized to administer some of this responsibility, EPA retains oversight authority to ensure the protection of human health and the environment.

## V [\(Back to top\)](#)

**vadose zone**—The zone between the land surface and the water table within which the moisture content is less than saturation (except in the capillary fringe) and pressure is less than atmospheric. Soil pore space also typically contains air or other gases. The capillary fringe is included in the vadose zone.

**verification**—A test or tests, generally performed before and after logging in lieu of a calibration, to ascertain whether the logging system is operating properly. Verification differs from calibration in that it does not provide updated system-calibration values.

## W [\(Back to top\)](#)

**water balance**—The relationship between water input (precipitation) and water output (runoff, evapotranspiration, and recharge) in a hydrological system.

**water content**—The amount of water in an unsaturated medium, expressed as the ratio of the weight of water in a sample to the weight of the oven-dried sample (often expressed as a percentage).

**watercourse**—Any river, creek, arroyo, canyon, draw, wash, or other channel that has definite banks and beds and provides visual evidence of the occasional flow of water.

**watershed**—A region or basin drained by, or contributing waters to, a river, stream, lake, or other body of water and separated from adjacent drainage areas by a divide, such as a mesa, ridge, or other geologic feature.

**water table**—The top of the regional saturated zone; the piezometric surface associated with an unconfined aquifer.

**welded tuff**—A volcanic deposit hardened by the action of heat, pressures from overlying material, and hot gases.

**well casing**—A solid piece of pipe, typically steel or polyvinyl chloride (PVC) plastic, used to keep a well open in either unconsolidated materials or unstable rock and as a means to contain zone-isolation materials such as cement grout or bentonite.

**well screen**—A perforated wire-wrapped casing that allows fluids, but not solid material, to enter a well.

**wireline**—A logging cable used to support a logging tool and carry electrical power and signals between the tool and surface instruments.

**work-performance assessment**—An evaluation that determines if Environmental Remediation and Surveillance Program work is being performed in accordance with quality program requirements and identifies areas for improving the quality of work processes.

**work plan**—A document that specifies the activities to be performed when implementing an investigation or remedy. At a minimum, the work plan should identify the scope of the work to be performed, specify the procedures to be used to perform the work, and present a schedule for performing the work. The work plan may also present the technical basis for performing the work.